UK Patent Application (19) GB (11) 2 193 025 (13) A

(43) Application published 27 Jan 1988

- (21) Application No 8709472
- (22) Date of filing 22 Apr 1987
- (30) Priority data

(31) 7147/86

[32] 25 Jul 1986 .

- (33) AU
- (71) Applicant

Ainsworth Nominees PTY. Limited

(Incorporated in Australia-New South Wales)

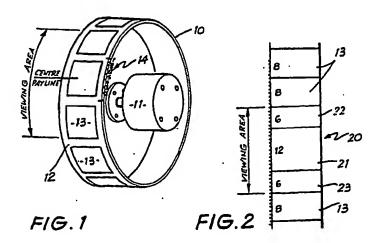
85-113 Dunning Avenue, Rosebery, New South Wales, Commonwealth of Australia

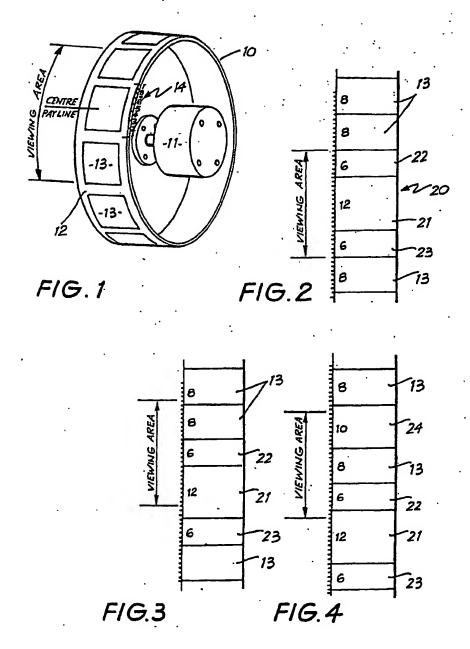
- (72) Inventors Richard Edward Smyth Daniel Alan Tracy
- (74) Agent and/or Address for Service G F Redfern & Co. High Holborn House, 52/54 High Helborn, Landon WC1V 6RL

- (61) INT CL G07F 17/34
- (52) Domestic classification (Edition J): **G4V 118 AA** U15 1174 G4V
- (56) Documents cited None
- (58) Field of search G4V Selected US specifications from IPC sub-classes A63F G07F

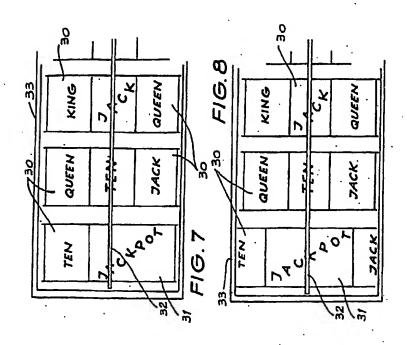
(54) Multi-size reel symbols

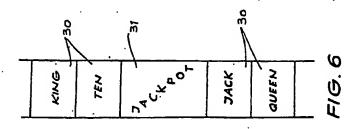
(57) Slot machine display reels are provided with a plurality of symbols 13 occupying differing proportions of the circumference of the reel, such that those symbols which require greater prominence, such as a jackpot, occupy a larger proportion of the circumference. Associated with each reel is a spinning mechanism, such as stopper motor 11, which is able to position any symbol on the reel centrally within an associated display window, irrespective of the size of that symbol, by taking the size of the respective symbol into account when determining the stopping position.

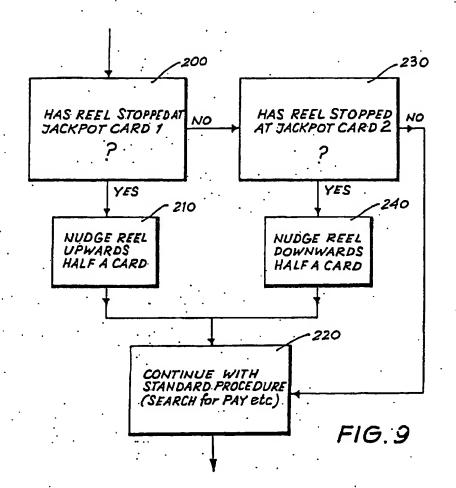


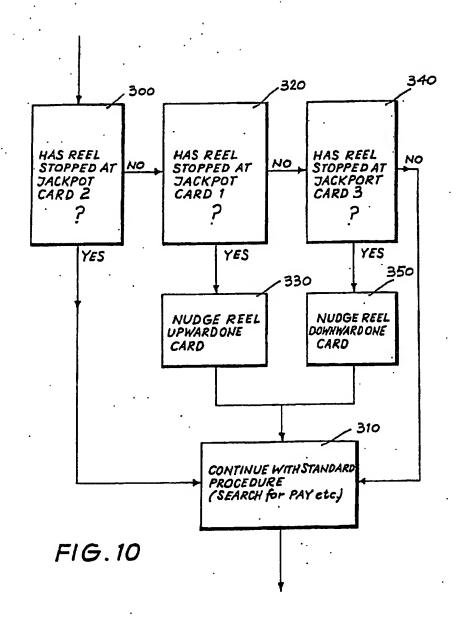


100 RANDOM NUMBER GENERATOR CHOOSES SYMBOL NUMBER TO BE DISPLAYED ON REEL. 110 LOOK UP TABLE TO DETERMINE THE NUMBER OFMOTOR PULSES REQUIRED TO STOP THE REEL FROM THE INDEX POSITION TO THE CHOSEN SYMBOL POSITION. 120 STEP REEL TO THE INDEX
POSITION AFTER A SUITABLE
NUMBER OF REVOLUTIONS
AND STEP THE NUMBER OF
STEPS DETERMINED BY THE LOOK UP TABLE. FIG.5









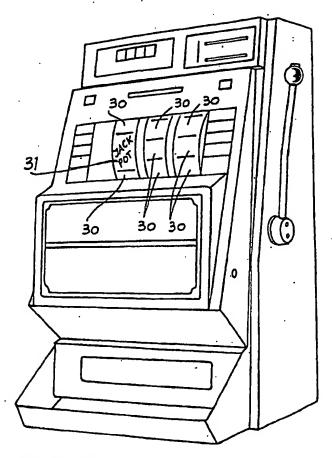


FIG.11

20

25

30

35

45

50

Multi-size reel symbols

5 The present invention relates to gaming machines of the type known as poker machines, fruit machines or slot machines and in particular the invention relates to improvements in poker machine display reels.

Historically, symbols on a particular sized poker machine reel have always been identical in

Historically, symbols on a particular sized poker machine reel have always been identical in height, or more specifically the space allocated to each symbol has been equal, irrespective of the size of the symbol comtained thereon. For example, the area allocated for an "orange" symbol is the same size as that for a "bar" symbol even though the picture for the bar symbol is not as high as that for the orange. In the past, the space allocated to each symbol, which is generally referred to as a "card", has been a function of the number of stops on the reel and the provision of equal spacing for each symbol has been dictated by the mechanical nature of

15 the reel stopping mechanism. Further it has been the practice in the past to allocate one symbol for each stopping position of the reel. However, this limitation does not apply to stepper motor driven machines where the final reel position is predetermined before the spinning of the reel and where the stepping motor is able to step the reel in increments which are substantially smaller than the height allocated to each reel symbol. Also, the possibility exists in conventional machines to include symbols which occupy a space which is a multiple of the prior art symbol

The present invention consists in a reel for a poker machine display, said reel including a cylindrical peripheral surface to which a plurality of indicia are applied, each of said indicia having a symbol space within which the indicia is substantially centrally located, said symbol space occupying a proportion of the circumference of the cylindrical surface which is different for

different indicia on said surface.

The provision of symbols of different sizes around the periphery of the poker machine reel allows the use of larger indicia for those reel positions which feature in larger pay outs, thereby

making it easier for the player to recognise those symbols.

In the case of stepping motor driven machines, the provision of indicia of different sizes also has the additional advantage that it allows the implementation of poker machine reels on which the number of indicia is not an integral sub-multiple of the number of pulses required to step through a full revolution. For example, a stepping motor which is typically used to drive a poker machine real will be driven through one revolution by applying 200 pulses to the motor.

Therefore, if the reel is provided with 25 indicia, 8 pulses are required to step the reel by one symbol position, however, if all symbols were spaced by an equal number of pulses, it would not be possible to produce reels having 21, 22 or 23 symbols. In contrast, poker machine reels made in accordance with the present invention may have any number of symbols and the number of motor pulses associated with each symbol may be adjusted in relation to the height 40 of the symbol, with the total for one revolution of the reel still adding up to 200 pulses.

The invention is of particular advantage in the United States where machines known as "Keno" type machines have only a few symbols spaced around the periphery of their reels with the remainder of the reels being blank. In such machines the symbol positions upon which the reel stops, after it is rotated, may be unevenly spaced such that the stopping positions either side of the symbol position are spaced further from the symbol position than are adjacent stopping positions associated with blank portions of the reel. The present invention permits the area occupied by the symbols on the Keno reel (typically "bar" symbols) to be two or three

times their present size with the intervening blanks correspondingly smaller.

As it is usual to have several blank symbols joining each other between each bar symbol, and 50 as there is usually no dividing line between adjacent symbols, it would not be obvious, to players of the machine that the different symbols were allocated different proportions of the circumference of the reel and therefore the invention would not provide any visually disturbing effect when applied to Keno machines. Further, any apparent abnormality in the display when applied to normal poker machines would also be minimal.

Stepping motor driven poker machines using a 200 pulse per revolution motor, and equipped with reels in accordance with the present invention, can be operated with 20, 21, 22, 23 or even 26 symbol reels instead of the typical 25 symbol reels presently used.

In some cases, where a large symbol is displayed in the position adjacent to the centre-line, some proportion of that symbol may be obscured from view if the player does not adjust his 60 viewing position, however, this is not considered to be a significant disadvantage. Also, in those cases where the symbol adjacent to the symbol of the centre-line is smaller than the nominal symbol height, a small portion of the next symbol may also be visible.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Fig. 1 illustrates a typical prior art machine having 25 equally sized symbol spaces;

. 65

60

Fig. 2 illustrates a portion of a 25 symbol reel strip, for use in a stepping motor driven	
machine, in which the spaces allocated to the symbols are not all equal; Fig. 3 illustrates the portion of the symbol strip of Fig. 2 when moved down one symbol	
position relative to the viewing window;	
5 Fig. 4 illustrates a portion of a symbol strip having 23 symbols; Fig. 5 illustrates a portion of a flow chart indicating the manner in which control of the	5
stepping motor would be implemented in a typical poker machine control programme.	
Fig. 6 illustrates a portion of a 24 symbol reel strip for a non stepping motor driven machine.	
In which one symbol position ("JACKPOT") occupies twice the space of the remainder of the 10 symbols on the strip;	10
Fig. 7 illustrates a poker-machine window having a reel in the first position which is finted with	
a real strip similar to that of Fig. 6;	
Fig. 8 illustrates the window of Fig. 7 with the first reel "nudged" up by one half symbol to centre the double sized "JACKPOT" symbol;	
15 Fig. 9 illustrates a portion of a flow chart for a machine using the real strip of Fig. 6, showing	15
the programme sequence required to test for the occurrence of the double sized symbol on the	•
centre line and to nudge the reel forward or backward one half card if necessary to centralize the double sized symbol; and	
Fig. 10 illustrates a portion of a flow chart similar to that of Fig. 9, for a machine fitted with a	
20 real strip provided with a triple sized symbol, the flow chart showing the programme sequence required to test for the triple sized symbol on the centre line and to mudge the symbol backward	20
or forward by one card if necessary to centre the triple sized symbol.	
Fig. 11 illustrates a poker machine incorporating the reels made in accordance with the present	
invention. 25 Referring now to Fig. 1, a typical reel 10 of a prior art stapper motor driven poker machine	25
having a 200 pulse per revolution stepper motor 11 is illustrated. The reel strip 12 of the prior	
art reel has 25 equally sized symbols 13 located about its periphery and the usual viewing area through which three adjacent symbols may be viewed is indicated. Markings 14 have been	
superimposed on the edge of the reel to indicate the 8 pulses which are applied to the motor to	
30 move the reel by one symbol position or 1/25th of a revolution.	30
Referring now to Fig. 2, a reel strip 20 for a stepping motor machine according to the present invention is illustrated wherein not all of the symbol positions 13 are of equal size and in this	
example the symbol sizes are allocated as follows:	
35 l symbol @ 12 pulses = 12	35
2 symbols 0 6 pulses = 12	05
· · · · · · · · · · · · · · · · · · ·	
22 symbols @ 8 pulses = 176	
40 25 symbols 200 pulses = 1 revolution	40
The reel strip is shown stopped in a position with the featured symbol 21, which has a height	
of 12 pulses located in the centre of the viewing area. In this case each of the adjoining	
symbols 22, 23 exactly fit into the viewing space. 45 In Fig. 3, the same reel strip is illustrated when stopped one symbol lower giving the worst	45
viewing condition. In this case one of the smallest symbols is exactly in the centre position, with	
the card above in full view and a fraction of the next card showing, the large card below centre is partly obscured unless the player moves his viewing position slightly.	
The portion of a reel strip illustrated in Fig. 4 is devised to have a total of 23 symbols which	
50 typically comprise:	50
l symbol @ 12 pulses = 12	•
55 2 symbols @ 6 pulses = 12	55
12 symbols @ 8 pulses = 96	
12 3/mo13 6	
	_
When this reel strip is moved upward by two symbols, to show the 12 pulse feature symbol	60
21 on the centre line, the display will be identical to that of Fig. 2.	
Other reel combinations having a set of indicia which is not an integral sub-multiple of the	
number of pulses per revolution may be devised and some examples of these are set out below:	
•	

	21	Symbols					•		•		
	1	symbol	9	12 pulses	=	12				•	• •
5	.2	symbols	6	6 pulses	=	12		•			5
	2	symbols	8	8 pulses	=	16					
•	16	symbols	9	10 pulses	=	160					
10	21	symbols		•		200	pulses	•			10
	22	Symbols								٠	
	1	symbol	9	12 pulses	=	12					•
15	2	symbols	9	6 pulses	=	12					15
	7	symbols	e .	8 pulses	=	56					•
	12	symbols	9	10 pulses	=	120					
20	22	symbols				200	pulses				20

Typically in prior art poker machines employing stepping motors 11 to drive the reels 10, the stopping position of the reel is determined by randomly selecting the symbol number of the symbol upon which the reel is to stop and then, having stepped the reel to the index position, the reel is stepped on by a number of steps equal to the symbol number multiplied by the number of motor pulses per symbol. Clearly, this technique must be modified slightly in order to allow for the unequal symbol sizes of the reel of the present invention. However, a relatively simple modification to the typical control scheme is all that is required in order to accommodate 30 reels in accordance with the present invention.

Referring to Fig. 5, a portion of a flow chart describing the control programme of a poker machine, in which the dashed arrows represent portions of an existing poker machine control programme which are not described here. The black labelled 100 represents the random selection of a symbol upon which the particular reel is to be stopped, this being a pre-existing step in the control programme of many poker machines. In poker machines using reels in accordance with the present invention, an additional step 110 is inserted after the random selection step 100 of the prior art machine, the step 110 being used to look up a look up table which gives the reel stopping position for each symbol on the real relative to the index position, in terms of the number of motor pulses required to step the reel from the index position to the selected symbol. Finally, in the motor control portion of the poker machine control programme, the motor is controlled to first provide a number of revolutions of the reel and then finally to step to the index position and execute a number of steps equal to the number looked up in the look up table. This programme step indicated as Item 120 would replace the prior art procedure of stepping on from the index position by a number of steps equal to the symbol number multiplied

45 by the number of steps per symbol. Referring to Figs. 6-10, conventional poker machines with the free spinning reels are generally provided with stopping mechanisms which allow the reels to be stopped at half card or full card intervals, where a card 30 is the standard division of the circumference of the reel and typically there are 25 cards to a reel. In such machines it is possible to implement the present invention 50 by using symbol areas which are multiples (ag. 2x or 3x) the standard card such as with the

"JACKPOT" symbol 31 of Figs. 6, 7 and 8.

When multiple card symbols 31 are used, however, it becomes necessary to test the reel when stopped, to determine whether a large card is in the centre line 32 of the window 33 and if so whether it is centred on the centre line 32. In the case of a double sized card 31, as illustrated in Figs. 6, 7 and 8, it will be necessary to nudge the card forward or backward by half a card, if the large symbol is not centred on the centre line 32. The technique of nudging is well known and understood and a variety of prior art machines have been produced in which the

reels could be nudged forward or backward by one or more positions, for various purposes, and an explanation of the mechanism used will not be given here.

Referring to Fig. 9, centering of the double sized symbol of Figs. 6-8 is achieved by first testing (200) to see if the reel has stopped on the first half of the double sized card, and if so causing the reel to be nudged upward (210) by one half card and then cominuing (220) with the standard procedure. If the reel had not stopped on the first half of the double sized card, the programme would then test (230) to see if the reel had stopped on the second half of the double sized card and if so the reel would be caused to be nudged downward (240) by half a

ENSOCOD 4GB _ Z1EDOZSA_L>

60

55

45

ĐŪ

25

. 65

15

20

25

35

40

45

5 will be necessary under some circumstances to nudge the reel forward or backward by a full card position. Referring to Fig. 10, the flow chart for a symbol centering routine for a machine with a triple sized symbol is illustrated, from which it will be seen that once the reel has stopped spinning, the reel is tested (300) to determine whether it has stopped with the central portion of the triple sized symbol on the centre line, in which case standard processing will be 10 continued (310). If the real had not stopped on the central portion of the large symbol, a test is performed (320) to determine whether the reel has stopped on the first portion of the large symbol, in which case the reel will be nudged upward (330) by one card and standard processing continued (310). Finally, if the reel has not stopped on the first or second cards of the large

symbol, a test is performed (340) to determine if the reel has stopped on the third card of the 15 large symbol in which case the reel will nudge downward (350) by one card before standard processing is continued (310). Alternatively, if the reel has not stopped with any cards of the triple sized symbol on the centre line, no nudging will take place and standard processing will continue (310).

It will be recognised by persons skilled in the art that numerous variations and modifications 20 may be made to the invention as described above without departing from the spirit or scope of the invention as broadly described.

CLAIMS

- 1. A reel for a poker machine display, said reel including a cylindrical peripheral surface to 25 which a plurality of indicia are applied, each of said indicia having a symbol space within which the indicia is substantially centrally located, said symbol spaces occupying a proportion of the circumference of the cylindrical surface which is different for different indicia on said surface.
- 2. The reel as claimed in claim 1 wherein a majority of the indicia on said reel have symbol spaces of uniform size and the remainder of the indicia have a symbol space which differs from 30 the uniform size by an amount which is a fraction of the uniform size.
 - 3. The real as claimed in claim 1 wherein a majority of the indicia on said real have symbol spaces of uniform size and the remainder of the indicia have a symbol space which is an integer multiple of the uniform size.
- 4. A poker machine including one or more reels as claimed in claim 1, 2 or 3, each of said 35 reels being driven by a stepping motor and each of the symbol spaces occupying a proportion of the circumference of the reel which is a multiple of the incremental rotational step size of its respective stepping motor.
- 5. The poker machine of claim 4 wherein a look up table is provided in which are stored the number of motor steps corresponding to each symbol space on the reels, the look up table 40 being used to calculate the correct number of steps required to stop a reel with any given symbol centered on a display centre line.
 - 6. A poker machine including one or more reels as claimed in claim 1 or 3, the machine being provided with nudging means for nudging a reel forward or backward by an amount necessary to centre one of said remainder of the indicia on a display centre line when the respective indicia

45 has come to rest on said centre line without being centered thereon.

Michael 1988 et The Penns Office, Sisso House, 66/71 High Holborn, London WC 1R 4TP, Further copies may be obseived th e Penens Office, Sales Branch, St Many Cray, Orpingson, Kens BRS 3RD. Printed by Burgess & Sen (Albingdon) Ltd. Con., 1/87.

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

□ BLACK BORDERS
□ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
□ FADED TEXT OR DRAWING
□ BLURRED OR ILLEGIBLE TEXT OR DRAWING
□ SKEWED/SLANTED IMAGES
□ COLOR OR BLACK AND WHITE PHOTOGRAPHS

IMAGES ARE BEST AVAILABLE COPY.

☐ LINES OR MARKS ON ORIGINAL DOCUMENT

☐ GRAY SCALE DOCUMENTS

☐ OTHER:

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.

☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY

UK Patent Application (19) GB (11) 2 193 025 (13) A

(43) Application published 27 Jan 1988

- (21) Application No 8709472
- (22) Date of filing 22 Apr 1987
- (30) Priority data (31) 7147/88
- (32) 25 Jul 1986
- (33) AU
- (71) Applicant Ainsworth Nominees PTY. Limited

(Incorporated in Australia-New South Wales)

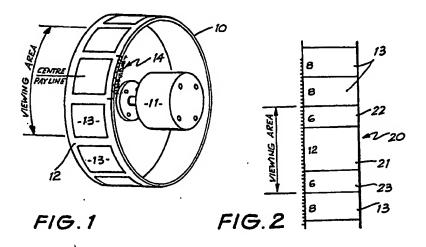
85-113 Dunning Avenue, Rosebery, New South Wales. Commonwealth of Australia

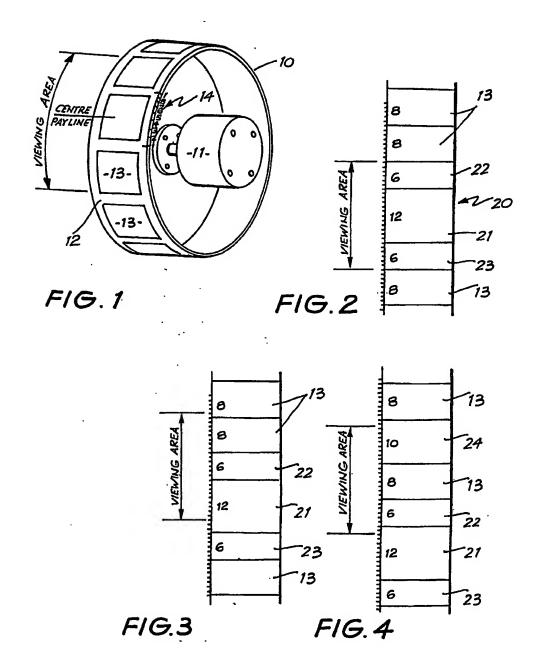
- (72) Inventors Richard Edward Smyth **Daniel Alan Tracy**
- (74) Agent and/or Address for Service G F Redfem & Co. High Helbern House, 52/54 High Helbern, Landon WC1V 6RL

- (61) INT CL* G07F 17/34
- (52) Domestic classification (Edition J): G4V 118 AA U18 1174 G4V
- (56) Documents cited None
- (58) Field of search G4V Selected US specifications from IPC sub-classes A63F

(54) Multi-size reel symbols

(57) Slot machine display reels are provided with a plurality of symbols 13 occupying differing proportions of the circumference of the reel, such that those symbols which require greater prominance, such as a jackpot, occupy a larger proportion of the circumference. Associated with each reel is a spinning mechanism, such as stopper motor 11, which is able to position any symbol on the reel centrally within an associated display window, irrespective of the size of that symbol, by taking the size of the respective symbol into account when determining the stopping position.





- 100

RANDOM NUMBER GENERATOR CHOOSES SYMBOL NUMBER TO BE DISPLAYED ON REEL.

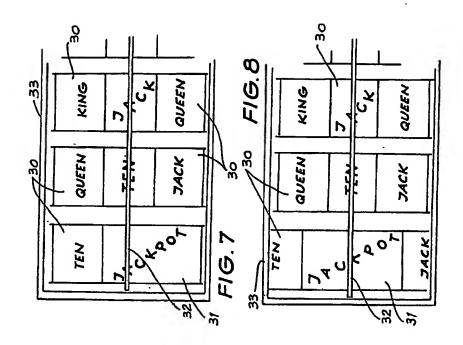
-110

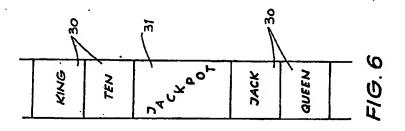
LOOK UP TABLE TO DETERMINE THE NUMBER OF MOTOR PULSES REQUIRED TO STOP THE REEL FROM THE INDEX POSITION TO THE CHOSEN SYMBOL POSITION.

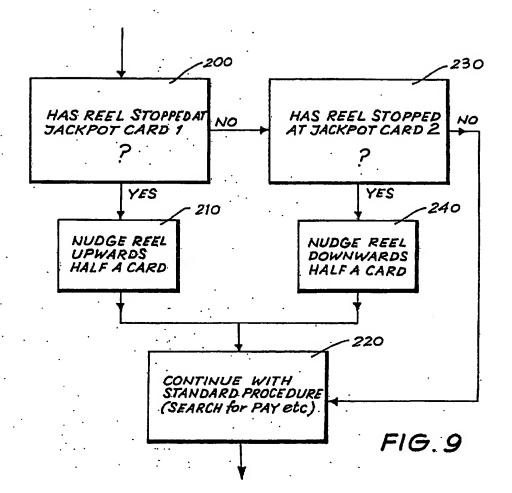
- 120

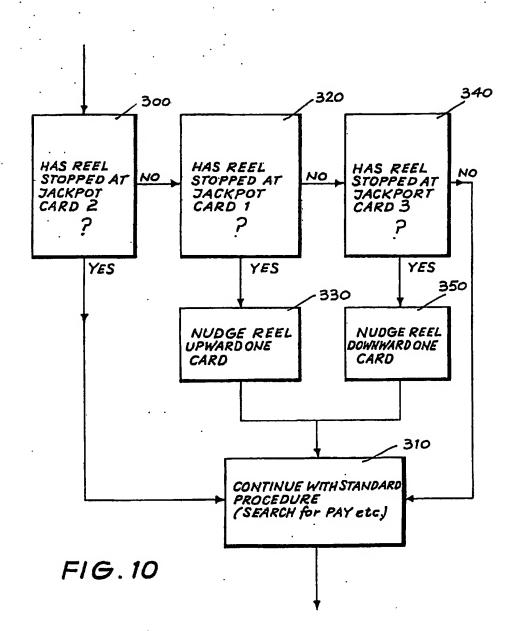
STEP REEL TO THE INDEX
POSITION AFTER A SUITABLE
NUMBER OF REVOLUTIONS
AND STEP THE NUMBER OF
STEPS DETERMINED BY THE
LOOK UP TABLE

FIG.5









: 7 (

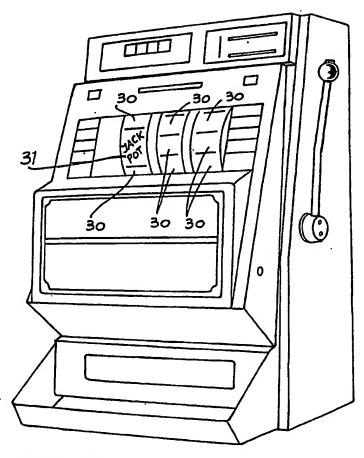


FIG.11

.

SPECIFICATION

	Multi-size reel symbols	
5	The present invention relates to gaming machines of the type known as poker machines, fruit machines or slot machines and in particular the invention relates to improvements in poker machine display reals.	5
10	Historically, symbols on a particular sized poker machine reel have always been identical in height, or more specifically the space allocated to each symbol has been equal, irrespective of the size of the symbol contained thereon. For example, the area allocated for an "orange" symbol is the same size as that for a "bar" symbol even though the picture for the bar symbol is not as high as that for the orange. In the past, the space allocated to each symbol, which is generally referred to as a "card", has been a function of the number of stops on the reel and	10
15	the provision of equal spacing for each symbol has been dictated by the mechanical nature of the reel stopping mechanism. Further it has been the practice in the past to allocate one symbol for each stopping position of the reel. However, this limitation does not apply to stepper motor driven machines where the final reel position is predetermined before the spinning of the reel and where the stepping motor is able to step the reel in increments which are substantially smaller than the height allocated to each reel symbol. Also, the possibility exists in conventional	15
20	machines to include symbols which occupy a space which is a multiple of the prior art symbol space or card. The present invention consists in a reel for a poker machine display, said reel including a	20
25	cylindrical peripheral surface to which a plurality of indicia are applied, each of said indicia having a symbol space within which the indicia is substantially centrally located, said symbol space occupying a proportion of the circumference of the cylindrical surface which is different for different indicia on said surface.	25
30	The provision of symbols of different sizes around the periphery of the poker machine reel allows the use of larger indicia for those reel positions which feature in larger pay outs, thereby making it easier for the player to recognise those symbols. In the case of stephen motor driven machine, the provision of indicia of different sizes also have the additional advantage that it allows the provision of additional advantage that it is a provision o	30
	has the additional advantage that it allows the implementation of poker machine reels on which the number of indicia is not an integral sub-multiple of the number of pulses required to step through a full revolution. For example, a stepping motor which is typically used to drive a poker machine reel will be driven through one revolution by applying 200 pulses to the motor.	
35	Therefore, if the reel is provided with 25 indicia, 8 pulses are required to step the reel by one symbol position, however, if all symbols were spaced by an equal number of pulses, it would not be possible to produce reels having 21, 22 or 23 symbols. In contrast, poker machine reels made in accordance with the present invention may have any number of symbols and the	35
40	number of motor pulses associated with each symbol may be adjusted in relation to the height of the symbol, with the total for one revolution of the reel still adding up to 200 pulses. The invention is of particular advantage in the United States where machines known as "Keno" type machines have only a few symbols spaced around the periphery of their reels with	40
45	the remainder of the reels being blank. In such machines the symbol positions upon which the reel stops, after it is rotated, may be unevenly spaced such that the stopping positions either side of the symbol position are spaced further from the symbol position than are adjacent stopping positions associated with blank portions of the reel. The present invention permits the area occupied by the symbols on the Keno reel (typically "ber" symbols) to be two or three times their present size with the intervening blanks correspondingly smaller.	45
50	As it is usual to have several blank symbols joining each other between each bar symbol, and as there is usually no dividing line between adjacent symbols, it would not be obvious, to players of the machine that the different symbols were allocated different proportions of the circumference of the reel and therefore the invention would not provide any visually disturbing effect when applied to Keno machines. Further, any apparent abnormality in the display when	50
55	applied to normal poker machines would also be minimal. Stepping motor driven poker machines using a 200 pulse per revolution motor, and equipped with reels in accordance with the present invention, can be operated with 20, 21, 22, 23 or even 26 symbol reels instead of the typical 25 symbol reels presently used.	55
60	In some cases, where a large symbol is displayed in the position adjacent to the centre-line, some proportion of that symbol may be obscured from view if the player does not adjust his viewing position, however, this is not considered to be a significant disadvantage. Also, in those cases where the symbol adjacent to the symbol of the centre-line is smaller than the nominal symbol height, a small portion of the next symbol may also be visible. Embodiments of the invention will now be described, by way of example, with reference to	60
65	the accompanying drawings in which: Fig. 1 illustrates a typical prior art machine having 25 equally sized symbol spaces;	65

•		
	Fig. 2 illustrates a portion of a 25 symbol reel strip, for use in a stepping motor driven machine, in which the spaces allocated to the symbols are not all equal; Fig. 3 illustrates the portion of the symbol strip of Fig. 2 when moved down one symbol	
5	position relative to the viewing window; Fig. 4 illustrates a portion of a symbol strip having 23 symbols; Fig. 5 illustrates a portion of a flow chart indicating the manner in which control of the stepping motor would be implemented in a typical poker machine control programme.	5
10	Fig. 6 illustrates a portion of a 24 symbol reel strip for a non stepping motor driven machine, in which one symbol position ("JACKPOT") occupies twice the space of the remainder of the symbols on the strip;	10
,,,	Fig. 7 illustrates a poker machine window having a reel in the first position which is fitted with a reel strip similar to that of Fig. 6;	10
15		15
	the programme sequence required to test for the occurrence of the double sized symbol on the centre line and to nudge the reel forward or backward one half card if necessary to centralize the double sized symbol; and	
20	Fig. 10 illustrates a portion of a flow chart similar to that of Fig. 9, for a machine fitted with a reel strip provided with a triple sized symbol, the flow chart showing the programme sequence required to test for the triple sized symbol on the centre line and to nudge the symbol backward or forward by one card if necessary to centre the triple sized symbol. Fig. 11 illustrates a poker machine incorporating the reels made in accordance with the present	20
25	Invention. Referring now to Fig. 1, a typical reel 10 of a prior art stepper motor driven poker machine having a 200 pulse per revolution stepper motor 11 is illustrated. The reel strip 12 of the prior art reel has 25 equally sized symbols 13 located about its periphery and the usual viewing area	25
30	through which three adjacent symbols may be viewed is indicated. Markings 14 have been superimposed on the edge of the reel to Indicate the 8 pulses which are applied to the motor to move the reel by one symbol position or 1/25th of a revolution. Referring now to Fig. 2, a reel strip 20 for a stepping motor machine according to the present invention is illustrated wherein not all of the symbol positions 13 are of equal size and in this example the symbol sizes are allocated as follows:	30
35	1 symbol @ 12 pulses = 12	35
	2 symbols @ 6 pulses = 12	
	22 symbols @ 8 pulses = 176	
40	25 symbols 200 pulses = 1 revolution	40
	The reel strip is shown stopped in a position with the featured symbol 21, which has a height of 12 pulses located in the centre of the viewing area. In this case each of the adjoining symbols 22, 23 exactly fit into the viewing space.	
45	In Fig. 3, the same reel strip is illustrated when stopped one symbol lower giving the worst viewing condition. In this case one of the smallest symbols is exactly in the centre position, with the card above in full view and a fraction of the next card showing, the large card below centre is partly obscured unless the player moves his viewing position slightly.	45
50	The portion of a reel strip illustrated in Fig. 4 is devised to have a total of 23 symbols which typically comprise:	50
	1 symbol @ 12 pulses = 12	
55	2 symbols @ 6 pulses = 12	55
	12 symbols @ 8 pulses = 96	
60	When this reel strip is moved upward by two symbols, to show the 12 pulse feature symbol 21 on the centre line, the display will be identical to that of Fig. 2. Other reel combinations having a set of indicia which is not an integral sub-multiple of the number of pulses per revolution may be devised and some examples of these are set out below:	60
	•	

	21	Symbols							
		symbols	•	12	pulses	Œ	12		
_		-			_		_		,
5		symbols			pulses	=	12		,
		symbols			pulses	=	16		
		symbols	9	10	pulses	=	<u>160</u>		
10	21	symbols			•		200	pulses	10
	22	Symbols						·	
	1	symbol	9	12	pulses	=	12		
15	2	symbols	6	6	pulses	=	12		1!
	7	symbols	ø	8	pulses	=	56		
	12	symbols	9	10	pulses	=	120	,	
20	22	symbols					200	pulses	20
		_			;				
25	stop symi the i num allov	ping position bol upon where is stepp ber of moto where the uncomestication	n of lich 1 ed o r pul equa	the re the re on by ises p	eel is determed is to stop a number oper symbol. bol sizes of	nine p an of ste Clea the	d by r d then eps eq rly, th reel c	stepping motors 11 to drive the reels 10, the andomly selecting the symbol number of the having stepped the reel to the index position, ual to the symbol number multiplied by the stechnique must be modified slightly in order to f the present invention. However, a relatively	25
30	reels	in accordar	ice v	vith t	he present	inver		e is all that is required in order to accommodate	30
	mac	hine, in whic	h th	e das	hed arrows	rep	resent	describing the control programme of a poker portions of an existing poker machine control plack labelled 100 represents the random selec-	
35	maci prog tion in th with 100	hine, in which is which is which is which is which is control protected the present of the prior	h the hard upo	e das e not on wh mme ention machi	thed arrows described hich the part of many po, an addition, the step	reprinere. dicula ker nal s	resent The l r reel machli tep 1 O beir	portions of an existing poker machine control block labelled 100 represents the random selection is to be stopped, this being a pre-existing stepnes. In poker machines using reels in accordance to its inserted after the random selection stepned used to look up a look up table which gives	3!
	maci prog tion in th with 100 the s the s symi is co index table	hine, in which the present of the present of the prior reel stopping number of the prior prior finally, portrolled to the prior at the	th the hard ogra- investigation the first care.	e das e not on wh mme ention machi sition r pulsa e mo provid execute me ste	thed arrows described I lich the part of many po, an additionine, the step for each syes required tor control to a number a number of indicated	reprinere. iculation libraria se	resent The I r reel maching 1 O being I on the tep the on of revoluteps etem 1	portions of an existing poker machine control block labelled 100 represents the random selectis to be stopped, this being a pre-existing stepnes. In poker machines using reels in accordance 10 is inserted after the random selection stepneg used to look up a look up table which gives he reel relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of	
40	maci prog tion in th with 100 the i the i symi is co index table step by ti	hine, in which the present of the present of the prior reel stopping number of number	th the hard ogra- inversion to the first arm of the first	e dase e not on who mme ention machi sition r pulse more providuate e te e inde eps p	thed arrows described I lich the part of many po, an additionine, the step for each syes required tor control pode a number a number poindicated x position the symbol.	reprinere. icula i	resent The lar reel machinetep 1 O being tep the on of revoluteps etem 1 number	portions of an existing poker machine control block labelled 100 represents the random selectis to be stopped, this being a pre-existing stepnes. In poker machines using reels in accordance 10 is inserted after the random selection stepning used to look up a look up table which gives he reel relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of art of steps equal to the symbol number multiplied	35 40 45
10	maci prog tion in th with 100 the i symi is co index table step by the Re prov	hine, in which the present of a symbol of a symbol of a symbol of the prior of the prior reel stopping number of model. Finally, ontrolled to the prior of the prior of the prior of the programment of the number of the number of the prior o	th the art upon ogramme investigation of the art opposite a call of the art opposite a call of the art of the art opposite a call of the art of	e das e not on wh mme ention machi sition r pulsi e mo provid xecute ne ste a inde eps p 8-10, ing mark	thed arrows described I lich the part of many poor, an additioning, the step for each sylves required tor control place a number a number a number symbol. conventions echanisms to is the star	repriners. iculation liculation l	resent The I r reel maching 1 O being tep 1 tep th on of revolu tem 1 numb oker m n allov i divis	portions of an existing poker machine control block labelled 100 represents the random selectis to be stopped, this being a pre-existing step less. In poker machines using reels in accordance 10 is inserted after the random selection step ig used to look up a look up table which gives he reel relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of ar of steps equal to the symbol number multiplied eachines with the free spinning reels are generally to the reels to be stopped at half card or full card on of the circumference of the reel and typically	44
10 15	maci prog tion in th with 100 the s the is symi is eccinded table step by the Res prov inter there by u	hine, in which the price of a symbol the present of the price of the p	th the and the angle of the ang	e das e not n wh mme ention machin machin r pulsi e mo provid kecute a inde pps p 10, nor 0 30 0 as wh 31 od 5 ym	thed arrows described I descri	repriners. idealistic services and services are services and services	resent The I r reel maching tep 1 O beir ol on to tep th on of revolu teps e tem 1 numb oker m h allov d divisi hines s (eg. ed., ho	portions of an existing poker machine control block labelled 100 represents the random selection to be stopped, this being a pre-existing step nes. In poker machines using reels in accordance 10 is inserted after the random selection step ag used to look up a look up table which gives as reel relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of arc of steps equal to the symbol number multiplied eachines with the free spinning reels are generally to the reels to be stopped at half card or full card ion of the circumference of the reel and typically it is possible to implement the present invention 2x or 3x) the standard card such as with the	44
10 15	maci programma in the strong is continued in the strong in th	hine, in which the present of a symbol the present of the prior reel stopping number of model. Finally, ontrolled to the prior ping on from the number of the prior of the pri	in the state of th	e das e not when me e dase e not when me e ention when me e ention e e mo provide e ention e e e e e e e e e e e e e e e e e e e	thed arrows described I ich the part of many poor, an addition, an addition ine, the step for each sylves required tor control is de a number an anumber of indicated ex position is conventional echanisms of its the step indicated in such aich are multiples. In such aich are multiples in the care of its in the care of its its will income its of its will income of an avant or backers.	reprinere. icula ker: nal sep 11 me	resent The I r reel machine tep 1 O beir ol on to tep the consistent on of revolute teps etem 1 number maker	portions of an existing poker machine control block labelled 100 represents the random selection to be stopped, this being a pre-existing step nes. In poker machines using reels in accordance 10 is inserted after the random selection step ag used to look up a look up table which gives as reel relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of are of steps equal to the symbol number multiplied achines with the free spinning reels are generally to the reels to be stopped at half card or full card on of the circumference of the reel and typically it is possible to implement the present invention 2x or 3x) the standard card such as with the wever, it becomes necessary to test the reel rd is in the centre line 32 of the window 33 and 1. In the case of a double sized card 31, as any to nudge the card forward or backward by in the centre line 32. The technique of nudging is for art machines have been produced in which the one or more positions, for various purposes, and	44
40 45 50	maci programme in the minus control of the minus co	hine, in which the prior the present of the prior reel stopping number of motion are position as the prior ping on from the number of the prior ping on from the number of the prior ping on from the number of the prior to prior the number of the prior to prior the	in the street of	e das e not when me e das e not when me e das e not when me e motor provide e motor provide e motor e	thed arrows described I descri	reprinere. icula ker : nal si k	resent The I r reel machine tep 1 O beir ol on to tep the on of revoluteps e tem 1 numb oker m h diovis h ines s (eg. ed., ho rge ca line 32 ecess atred of ord by ill not uble si ed on 10) by topped	portions of an existing poker machine control block labelled 100 represents the rendom selection to be stopped, this being a pre-existing step res. In poker machines using reels in accordance to it is inserted after the random selection step ag used to look up a look up table which gives are real relative to the index position, in terms of a reel from the index position to the selected the poker machine control programme, the motor tions of the reel and then finally to step to the qual to the number looked up in the look up 20 would replace the prior art procedure of are of steps equal to the symbol number multiplied achines with the free spinning reels are generally to the reels to be stopped at half card or full card on of the circumference of the reel and typically it is possible to implement the present invention 2x or 3x) the standard card such as with the rever, it becomes necessary to test the reel and the card of the card of a double sized card 31, as any to nudge the card forward or backward by in the centre line 32. The technique of nudging is for art machines have been produced in which the	44

15

20

25

30

35

40

45

card, before continuing (220) with the standard procedure. Alternatively, if the reel had not stopped on either helf of the double sized card, the programme would simply continue (220) with its standard procedure.

It is also possible to use reel strips using triple sized symbols (not shown), in which case it will be necessary under some circumstances to nudge the reel forward or backward by a full card position. Referring to Fig. 10, the flow chart for a symbol centering routine for a machine with a triple sized symbol is illustrated, from which it will be seen that once the reel has stopped spinning, the reel is tested (300) to determine whether it has stopped with the central portion of the triple sized symbol on the centre line, in which case standard processing will be continued (310). If the reel had not stopped on the central portion of the large symbol, a test is performed (320) to determine whether the reel has stopped on the first portion of the large symbol, in which case the reel will be nudged upward (330) by one card and standard processing continued (310). Finally, if the reel has not stopped on the third card of the large symbol in which case the reel will nudge downward (350) by one card before standard processing is continued (310). Alternatively, if the reel has not stopped with any cards of the triple sized symbol on the centre line, no nudging will take place and standard processing will continue (310).

It will be recognised by persons skilled in the art that numerous variations and modifications 20 may be made to the invention as described above without departing from the spirit or scope of the invention as broadly described.

CL AIMS

- A reel for a poker machine display, said reel including a cylindrical peripheral surface to
 which a plurality of indicia are applied, each of said indicia having a symbol space within which the indicia is substantially centrally located, said symbol spaces occupying a proportion of the circumference of the cylindrical surface which is different for different indicia on said surface.
- The reel as claimed in claim 1 wherein a majority of the indicia on said reel have symbol spaces of uniform size and the remainder of the indicia have a symbol space which differs from 30 the uniform size by an amount which is a fraction of the uniform size.
 - 3. The reel as claimed in claim 1 wherein a majority of the indicia on sald reel have symbol spaces of uniform size and the remainder of the indicia have a symbol space which is an integer multiple of the uniform size.
- 4. A poker machine including one or more reels as claimed in claim 1, 2 or 3, each of said 35 reels being driven by a stepping motor and each of the symbol spaces occupying a proportion of the circumference of the reel which is a multiple of the incremental rotational step size of its respective stepping motor.
- 5. The poker machine of claim 4 wherein a look up table is provided in which are stored the number of motor steps corresponding to each symbol space on the reels, the look up table 40 being used to calculate the correct number of steps required to stop a reel with any given symbol centered on a display centre line.
- 6. A poker machine including one or more reels as claimed in claim 1 or 3, the machine being provided with nudging means for nudging a reel forward or backward by an amount necessary to centre one of said remainder of the indicia on a display centre line when the respective indicia 45 has come to rest on said centre line without being centered thereon.

Published 1988 at The Pateint Office, State House, 65/71 High Holborn, London WC1R 4TP. Further copies may be obtained from The Patent Office, Sales Branch, St Mary Cray, Orphogon, Kent 8R5 3RD. Printed by Burgess & Son (Abingdon) Ltd. Con. 1/87.